

REMARKS / ARGUMENTS

Response to Amendment

Applicant acknowledges and appreciates that the Examiner has entered the amendment and remarks filed on April 30, 2007.

Amendments to the Claims of the Application

Claims 1 and 11 of the present application have been amended to eliminate the word “about” in reference to the titanium concentration of the catalyst.

Claim 1 of the present application has also been amended to include the limitations previously set forth in claim 10.

Claims 10 and 12 – 18 have been cancelled from the application.

Claims 1 – 9 and 11 are currently pending in the application.

Remarks Regarding Rejections under 35 USC §102(b)

All pending claims of the present application are rejected as being anticipated by U.S. Patent 5,773,589 (“the ‘589 patent” or “Shoji”). Shoji discloses a catalyst for steam reforming of lower hydrocarbons. Similarly, the catalyst claimed in the present application is for steam reforming of lower hydrocarbons. In the present application, the Applicant is not relying upon the preamble to establish a limitation of the claims.

The Examiner claims that the catalyst of Shoji comprises an Al_2O_3 support, 0.5 to 25 percent by weight CaO, at least part of the CaO forming a compound with the Al_2O_3 , and 3 to 20 percent by weight nickel. According to the Examiner, the catalyst pore volume is 0.2 ml/g or larger (referencing Shoji, col. 3, ln 4 – 5), and that the catalyst may contain, as impurities or additives, various metals which include titanium.

The Applicant does not challenge the Examiner’s position regarding anticipation of the claimed catalyst of the present application with respect to the inclusion of aluminum, calcium and nickel in the catalyst composition. For the purposes of this Amendment only, the Applicant will further accept that the concentrations of these materials as taught in the ‘589 patent anticipate the claimed concentrations of aluminum, calcium and nickel of the catalyst of the present application. Finally, for the purposes of this Amendment only, the Applicant will concede that Shoji teaches that titanium may be present as an impurity or additive in a catalyst prepared according to teachings of the ‘589 patent.

The Applicant does challenge the Examiner's position that Shoji teaches that the catalyst of the '589 patent has a pore volume equal to or greater than 0.2 ml/g. The Applicant further contends that the catalyst of the '589 patent does not anticipate or make obvious the inclusion of titanium in the catalyst at a concentration of 0.01 wt% to 20 wt% as required of amended claim 1 of the present application.

With respect to pore volume, Appellant respectfully disagrees with the Examiner's analysis of Shoji. First, Shoji at col. 3, lines 2 – 5 reads "... it is referred to as the void fraction. In this connection, the pore volume with a diameter of 0.1 to 0.5 μ m of 0.2 ml/g or larger in the steam reforming catalysts for lower hydrocarbons previously disclosed by the present inventors ...". This passage does not state a pore volume for the catalyst of Shoji. Rather, it is merely part of a teaching for how to calculate what Shoji calls a void fraction. Regarding pore volume, Shoji states "[t]he quantity of porosity is expressed in terms of pore volume per unit weight of catalyst. However, in the case of catalysts which are constituted of various elements and in which the contents thereof vary as in the present invention, the expression in terms of the pore volume per unit weight of the catalyst is not appropriate because such catalysts have various densities." (Column 2, lines 55 – 62) Thus, the claimed pore volume cannot be met by the teaching of Shoji because Shoji expressly rejected pore volume as an acceptable criterion for comparison.

Titanium, among other elements, is mentioned in Shoji only in passing as a possible impurity or additive (Column 4, lines 52 – 57). However, Shoji fails to provide any guidance regarding the amount of titanium that should be present in the catalyst. In fact, Shoji fails to state at what concentration the titanium becomes an "additive" rather than an "impurity". The Examiner acknowledges that "Shoji is silent with respect to the specific amount of the impurities or additives which may be contained in the disclosed catalyst..." But she then contends that "it is inherent that the disclosed impurities or additives amounts of the metal(s) contained in the disclosed catalyst would be at least the minimal amount of 0.01 wt% that applicants claiming." The Examiner has provided nothing more than an unsubstantiated statement to support the argument that the amount of promoter claimed in the present application is inherent in the catalyst taught by Shoji. "To establish inherency, the extrinsic evidence 'must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill. Inherency, however, may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient.'" (MPEP §2163.07(a) citing *In re Robertson*, 169 F.3d 743, 745, 49 USPQ2d 1949, 1950-51 (Fed. Cir. 1999)) There does not appear to be any extrinsic evidence to support the argument that the amount of titanium is inherent. There is no teaching or suggestion in Shoji of how much titanium might be added to the catalyst, or might be present as an impurity. There is just a possibility that a catalyst having all the other limitations of claim 1 would also have titanium at a

concentration of from 0.01 wt% to 20 wt% of the catalyst. But that possibility is not sufficient to justify a rejection based on inherency. Thus, Applicant respectfully requests that all claims rejected on the basis of 0.01 wt% to 20 wt% titanium being inherent in view of Shoji be allowed.

The examiner also argues that the claimed BET surface area and Ni surface area are inherently met by the catalyst disclosed in Shoji. But Shoji does not disclose any particular values of BET surface area or of Ni surface area and there is no evidence in Shoji that BET surface area of the catalyst taught therein exceeds $4 \text{ m}^2/\text{g}$, or that the Ni surface area exceeds $2 \text{ m}^2/\text{g}$. The Examiner's inherency argument rests merely on the assumption that the catalyst disclosed in Shoji and the catalyst disclosed in the present application are the same catalyst and the same metal amounts. We disagree with this assumption – specifically the assumption that the catalyst is the same catalyst. As is known by those skilled in the art, a catalyst is not only defined in terms of components, but also how those components are treated during the manufacturing process – including order of addition, drying stages, calcination times and temperatures. In the present case, the two processes for manufacture differ in several critical areas, such as steam treatment of the carrier, carrier calcination conditions, number of nickel impregnation cycles, and calcination time, temperature and number of calcinations for the nickel-impregnated catalyst. In view of the fact that it is not clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill, the Applicant contends that there is no basis for rejection of Claims 6 – 9. Applicant respectfully requests that all claims rejected on the basis of surface area being inherent in view of Shoji be allowed.

Thus, pending claims 1 – 9 and 11 are neither anticipated nor obvious in view of Shoji. Applicant respectfully requests that a timely Notice of Allowance be issued in this case.

Respectfully submitted,



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